Acute hospital care of the elderly: minimizing the risk of functional decline

ROBERT M. PALMER, MD, MPH

CLINICAL ISSUES Between 25% and 60% of older patients in the hospital undergoing care for an acute illness risk some loss of independent physical function. This loss may lead to prolonged hospital stay, nursing-home placement, or death. The risk of functional decline is related to the hospital environment, as well as to the physical frailty of the patient, disease severity, and cognitive impairment.

KEY POINTS An interdisciplinary approach may prevent functional decline. The aim is to modify the physical environment, prevent iatrogenic illness, detect and treat functional impairments, promote mobility, assess and treat nutritional problems, and address the patient's personal needs and values.

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From the Department of Medicine, Case Western Reserve University and the Cleveland Clinic Foundation, Cleveland.
Address reprint requests to R.M.P., Section of Geriatric Medicine, The Cleveland Clinic Foundation, 9500 Euclid Avenue, Cleveland, OH 44195.

FOR MANY frail, elderly patients suffering from severe illnesses, the hospital is a dangerous place.[1] The hospital environment, enforced bed rest, undernutrition, and iatrogenic illnesses often conspire to render formerly independent patients incapable of caring for themselves. Too often, we cure the illness that caused the hospitalization but leave the patient worse off in the process. Fortunately, we are learning how to reduce the risk of this.

People over age 65 constitute the fastest growing segment of the American population. Although they number only 12% of the population, they account for 30% of all hospital discharges and 41% of all inpatient days in the United States.[2] The rate of hospitalization is nearly twice as high in the rapidly growing 85 and older age group compared with the 65 to 74 age group.[2]

These trends persist despite the decline in hospitalization rates and in the average length of hospital stay that occurred after the introduction of Medicare's prospective payment system.[3] The evolution of prospective payment and managed health care, the proliferation of home care and other long-term care services, and the increasing prevalence of chronic dis-

TABLE 1
GERIATRIC SYNDROMES: KEY POINTS

Dementia
    Affects 5% of patients aged 65 or older
    Alzheimer's disease and vascular dementia account
        for ≥ 80% of cases
    Screening needed to detect reversible causes

Delirium
    Incidence of 25% in hospitalized elderly patients
    Affects attention and alertness
    Most commonly caused by infections
        (pneumonia, urosepsis), stroke, drug intoxication
    Usually improves when underlying cause resolves

Urinary incontinence
    Prevalence of 20% to 30% in community-dwelling
        patients aged 75 or older
    Underreported by patients
    Most cases are treatable
    In hospital, often associated with delirium
        and Foley catheter use

Hearing impairment
    Affects approximately 30% of patients
        aged 65 or older
    Screening detects treatable hearing loss
    Hearing aids often helpful

Visual impairment
    Prevalence of approximately 13%
        in community-dwelling patients older than 65 years
    Common causes (glaucoma and cataracts) are treatable

Depression
    Approximately 10% of hospitalized patients aged 65
        or older have depressive symptoms
    Atypical presentations (somatic symptoms, dementia)
        sometimes occur
    Treatment is usually effective

Iatrogenic illness
    Risk of adverse drug effects increases with the number
        of medications prescribed
    Drug disposition affected by aging—usual adult doses
        may be excessive
    Preparation for diagnostic procedures may cause illness
    Physical restraints cause immobility

Failure to thrive
    Functional decline, weight loss, and social withdrawal
        are seen in patients with dementia, delirium,
        depression, drug reactions, and chronic diseases
    Protein-calorie malnutrition may increase mortality risk

Immobility
    Bed rest and physical and chemical restraints
        predispose patients to deconditioning, postural
        pressure sores
    Physical activity often not ordered by physicians

eases that often require hospitalization for acute exacerbations are shaping the practice of medicine and influencing the outcomes of hospitalization.[4,5] The ultimate effect of these secular changes is unclear.[6]

ADVERSE CONSEQUENCES OF HOSPITALIZATION

The fast-paced and technology-intensive environment of the hospital may contribute to a decline in an older patient's functional status, ie, the ability to carry out independently the physical, mental, and social activities of daily life. Functional decline reflects the personal disabilities and social handicaps that result from impairments—losses or abnormalities of physiologic or psychologic function at the organ level.[7] Physical function is commonly described in terms of activities of daily living, both basic (bathing, dressing, transferring from bed to chair, using the toilet, remaining continent) and instrumental (shopping, housekeeping, preparing meals, taking medications, handling finances, using public transportation).[8,9]

The percentage of older people who need help with any basic activity of daily living increases with age. Community residents ages 65 to 74 are unlikely to need help: fewer than 5% need help in bathing, dressing, or transferring. In contrast, among those age 85 and older, 21% need help in bathing and nearly 10% need help in using the toilet and transferring.[10] In the hospital, these very old patients are more likely to suffer functional decline than are younger patients.

Diminished homeostatic reserves and multiple comorbid conditions make the elderly especially vulnerable to functional decline.[1] Muscle mass, strength, and aerobic capacity diminish with age and may be further compromised by the deconditioning effects of sustained bed rest.[11] Postural instability, often manifested as orthostatic hypotension or falling, is associated with impaired baroreceptor reflexes and is exacerbated by prolonged bed rest.[1]

Patients with cognitive impairment, arthritis, joint diseases, and heart and respiratory failure risk further loss of independence.[1] A variety of geriatric syndromes—complexes of common medical problems with multiple causes—are closely associated with functional decline and commonly occur in hospitalized older patients (Table 1). Indeed, 25% to 60% of older patients experience a loss of independent physical function while being treated for an acute illness in the hospital.[12–15] Loss of independent function is associated with serious sequelae, including prolonged hospital stay, placement in a nursing home, and death.[16,17]

TABLE 2
FACTORS AFFECTING DRUG DISPOSITION IN OLDER PATIENTS

Process	Age-related physiologic changes	Clinical significance
Absorption	Increased gastric pH; decreased absorption surface	Little change in absorption
Distribution	Reduced total body water; reduced lean body mass; increased proportion of body fat	Higher concentration of water-soluble drugs (eg, alcohol); increased distribution and elimination half-life of fat-soluble drugs (eg, diazepam)
	Reduced serum albumin (usual aging)	Increased free fraction in plasma of protein-bound acidic drugs (eg, phenytoin)
	Increased alpha-1 acid glycoprotein	Minor decreases in free fraction of basic drugs (eg, propranolol)
Metabolism	Reduced hepatic mass; reduced hepatic blood flow; decreased metabolic capacity	Decreased first-pass metabolism; decreased rate of metabolism of some drugs (phase I: microsomal oxidation)
Renal elimination	Reduced renal plasma flow; reduced glomerular filtration rate (usual aging)	Decreased elimination of drugs and metabolites

Predicting functional decline

Factors present at hospital admission, such as pressure sores, cognitive impairment, functional dependency, and low social activity levels, portend further functional decline.[15] Delirium (an acute confusional state), when it develops in the hospital, strongly predicts functional decline.[17] It occurs in 25% of medically ill hospitalized elderly patients, most commonly in patients with severe systemic illness, dementia (chronic cognitive impairment), dehydration, and sensory impairments,[18] and it may persist after discharge.[17]

The levels of cognitive and psychosocial function are important predictors of surgical outcomes. In a prospective study of elderly patients hospitalized for hip fractures, patients who had chronic or acute cognitive impairments and depressive symptoms in the hospital had poorer functional recovery 1 year after discharge than patients who did not; patients who had more contact with their family and friends after they left the hospital had better recovery than patients who had less contact.[19] In another study, good physical function and cognition before a hip fracture bespoke satisfactory recovery and physical function afterward.[20] Depression after surgery was associated with poorer recovery in both functional and psychosocial status. These studies underscore the serious effects of physical, cognitive, and social dysfunction on clinical and functional outcomes of hospitalization and suggest that we might prevent or ameliorate adverse functional outcomes by preventing delirium and depression, or by detecting and treating them promptly.

The hospital environment and the processes of care contribute to functional decline in elderly patients hospitalized for acute medical illnesses beyond the decline attributable to the acute illness itself.[1] Of the many potentially responsible factors, four are particularly important: iatrogenic illness, bed rest and immobility, undernutrition, and the physical environment.

Iatrogenic illness

Iatrogenic illness (ie, any illness resulting from a diagnostic procedure or from any form of therapy, or a harmful event that is not a natural consequence of the patient's disease)[21] occurs most commonly in older patients.[22] Drug reactions, complications of diagnostic and therapeutic procedures,[23] nosocomial infections,[24,25] fluid and electrolyte disturbances,[26] and trauma (eg, falls) are the most commonly recognized iatrogenic illnesses. Other examples include pressure sores resulting from forced immobilization by physical restraints, hematomas from venipuncture and arterial catheterization, dehydration and hypernatremia following preparation for gastrointestinal studies, and acute renal failure caused by radiocontrast agents.[27] Advanced age increases the risk for nosocomial infections, including urinary tract infections, bacteremia, pneumonia, and wound infections.[24] Adverse events due to errors of omission and negligence occur more often in older patients as well.[28]

TABLE 3
DRUG INTERACTIONS IN OLDER PATIENTS

Type of interaction	Examples	Clinical implication
Interference with drug absorption	Antacids with digoxin, isoniazid, antipsychotics	Diminished drug effectiveness
Displacement from binding proteins	Warfarin, oral hypoglycemics, aspirin, chloral hydrate, other highly protein-bound drugs	Enhanced effects and increased risk of toxicity
Altered distribution	Digoxin and quinidine	Increased risk of toxicity
Altered metabolism	Cimetidine with propranolol, theophylline, phenytoin	Decreased drug clearance, enhanced effects, increased risk of toxicity
Altered excretion	Lithium and diuretics	Increased risk of toxicity and electrolyte imbalance
Pharmacological antagonism	Levodopa and clonidine	Decreased antiparkinsonism effects
Pharmacological synergism	Tricyclic antidepressants and antihypertensives	Increased risk of hypotension and mental status changes

The more severe the disease, the more profound the cognitive dysfunction, and the longer the patient stays in the hospital—the greater the risk of an iatrogenic event. In one study, iatrogenic complications (over half considered preventable) occurred in 58% of medically ill patients who stayed in the hospital for 15 or more days.[29]

Iatrogenic complications can also occur while patients are preparing for or undergoing diagnostic procedures and studies, when they miss scheduled treatments and therapies or suffer adverse effects from acute fluid and electrolyte disturbances, temporary starvation, and dehydration.[26]

Adverse drug reactions are the most common cause of iatrogenic illness, occurring in 20% to 25% of hospitalized elderly patients and accounting for 3% of hospital admissions in the United States.[30] The most important risk factor for adverse drug reactions is the number of medications the patient receives, although the class of medication is also important.[30] Because they have more illnesses and take more medications, elderly patients are more likely to experience adverse drug reactions than younger patients are. Examples include delirium caused by psychotropic medications,[27] falls associated with the use of benzodiazepines that have long elimination half-lives (eg, diazepam),[31] and urinary retention caused by medications with anticholinergic properties.[32]

Normal age-related alterations in drug disposition and tissue sensitivity (*Table 2*)[33] and drug interactions (*Table 3*) contribute to the risk. Although age-related changes in serum proteins and protein binding are generally inconsequential, older hospitalized patients often have reduced levels of serum albumin due to multiple chronic diseases or protein-calorie malnutrition. Doses of albumin-bound drugs (eg, phenytoin, sulfa, warfarin) need to be adjusted when the albumin level is low; doses of drugs metabolized by microsomal oxidation need to be adjusted when drugs metabolized in a similar manner are added to the regimen.

Both aging and illness can result in changes in hepatic metabolism and renal elimination. Creatinine production declines with age as the lean body mass decreases. Consequently, the serum creatinine concentration may remain "normal" even when the glomerular filtration rate has declined substantially due to chronic renal disease. Creatinine clearance can be estimated as $[(140 - \text{age}) \times \text{body weight (in kilograms)}] / (72 \times \text{serum creatinine concentration})$; in women the quotient is multiplied by 0.85.[34]

The high degree of biologic variability in old age, however, allows this formula to serve only as a guideline; frequent re-evaluation or therapeutic drug monitoring is needed.[33] Maintenance doses of drugs excreted by the kidney (eg, aminoglycosides, angiotensin-converting enzyme inhibitors) are usually lower in older patients. Changes in hepatic metabolism are highly variable, and no useful formula exists to help guide dosing of drugs metabolized by the liver. For most drugs that undergo phase II metabolism (nonmicrosomal oxidation), age-associated changes are not clinically important.[33]

Age-related changes in tissue sensitivity (pharmacodynamics) are less clearly documented. Although older patients are believed to be more sensitive to medications, the greater effects of drugs at

lower doses are largely attributable to age-related changes in drug disposition.[33] Increased sensitivity to some medications has been documented. Tissue sensitivity to potent analgesics, some benzodiazepines (eg, triazolam),[35] and warfarin[36] increases with age. Beta-receptor sensitivity (eg, to isoproterenol) decreases, which may explain why some elderly patients do not experience tachycardia with stress or adrenergic stimulation.[37]

Bed rest and immobility

Although elderly hospitalized patients often want to stay in bed, prolonged or sustained bed rest has deleterious physiologic effects.[38] Cardiac and muscular deconditioning begins within days.[11] Bed rest also predisposes patients to pressure sores, hypoxemia, accelerated bone loss, and constipation.[39] Patients who remain in bed or in a chair often do not receive physical therapy or perform exercises with the nurses, possibly worsening functional decline.[40]

Generalized weakness and postural light-headedness or hypotension are common symptoms that often make patients unable to get up or walk independently. Enforced bed rest and immobility are abetted by high beds, various tethers such as intravenous lines and Foley catheters, and physical and chemical restraints.[1]

Physical or mechanical restraints—devices used to inhibit free movement—include vests, belts, mittens, jackets, and wrist and ankle restraints. Bed rails, geriatric chairs, and wheelchairs are also sometimes classified as mechanical restraints.[41] Psychoactive drugs are often used as chemical restraints to prevent patients from falling or pulling out lines and tubes. Although restraints are commonly used, their effectiveness is not well established.[41]

Restraints are more likely to be used in patients who are older, have cognitive impairment, are at risk of injury to self or others, are frail, have monitors or treatment devices, and need to maintain body alignment.[41] Administrative pressure to avoid litigation, availability of restraint devices, staff attitudes, and insufficient staffing also predict restraint use.[41] Restraints are most often used to control problem behavior, interference with treatment, and falls.

However, physical restraints cause adverse physical and psychological effects. Complications of falls and death due to strangulation and injuries occur.[42] Patients suffer a loss of autonomy and may become agitated and angry when restraints are applied against their wishes.[41] Restrained patients have higher morbidity and mortality rates than do unrestrained patients, although this relationship is confounded by severity of disease.[43,44]

Undernutrition

Elderly patients, often malnourished to begin with, risk incident undernutrition in the hospital.[45] Chronic disease, cognitive impairment, social isolation, poor dentition, impaired thirst perception, and limited access to food and fluids predispose hospital patients to protein-calorie undernutrition and dehydration. Some patients with protein-calorie malnutrition are admitted to the hospital with a diagnosis of failure to thrive; these patients often have a history of functional decline, social withdrawal, and recent weight loss.[46,47] Dementia, delirium, depression, drug toxicity, and diseases such as cancer and heart failure are often present.[46]

Malnutrition impairs wound healing, predisposes to pressure sores, impairs immunity, possibly prolongs hospital stay, and even results in death.[45,48] In one study in a geriatric rehabilitation unit of a Veteran's Administration hospital, the risk of developing at least one medical complication correlated with the functional status and serum albumin concentration at admission, the amount of weight lost in the year before admission, and the presence of renal or pulmonary diseases.[45] In other studies of older patients hospitalized for acute illnesses, hypoalbuminemia and hypocholesterolemia (which indicate protein-calorie malnutrition) were associated with prolonged length of stay and greater risk of death in the hospital.[49,50] Undernutrition in the hospital may delay wound healing and contribute to the development of pressure sores. Short-term semistarvation induces disturbances in fluid and electrolyte balance and exacerbates generalized weakness.[45]

A hostile physical environment

The importance of a supportive physical environment has been demonstrated in nursing homes but has been less appreciated in hospitals.[51] The typical American hospital is structured to meet the needs of physicians and care-givers, not the patients. For older patients, the hospital can be a hostile environment. Raised beds make getting up and laying down difficult and risky. Cold, shiny floors look wet and make getting out of bed uncomfortable and frightening. Cluttered hallway corridors discourage independent ambulation and contribute to the risk of falling. Sterile-appearing walls and corridors fail to

TABLE 4
HOSPITAL CARE OF OLDER PATIENTS: KEY POINTS

Principle	Key points
Modify physical environment	Provide carpeting, clocks and calendars, visual contrasts, floor lighting, handrails, activity room
Prevent iatrogenic illness	Avoid polypharmacy, use lower initial doses of medications, use psychoactive medications judiciously, use alternatives to physical restraints, avoid unneeded studies
Detect and treat functional impairments	Conduct comprehensive assessment (basic activities of daily living, instrumental activities of daily living, cognition, mood, social function); link assessment to specific interventions (eg, assistive devices, exercise, toileting schedule); detect, evaluate, and treat delirium
Promote mobility	Do not limit physical activity; order bedside exercises to maintain muscle strength and joint flexibility
Assess and treat nutritional needs	Screen for protein-calorie malnutrition (weight loss, muscle wasting, low serum albumin and cholesterol, anemia); prescribe dietary fluids and calorie intake (monitor daily)
Recognize psychosocial needs and personal values	Attend to patient's need for comfort, relief of pain, and rest; maintain continuity of nursing care; optimize sensory input (vision, hearing); encourage social visits; review advance directives
Practice interdisciplinary care	Collaborate with health care team; begin discharge planning early; consider home care as an alternative to nursing-home placement; discharge patients when stable (afebrile, normotensive, no new symptoms)

trogenic illness, quickly detecting and managing functional impairments, promoting mobility and physical activity, assessing and modifying nutrition, attending to psychosocial needs and personal values, and practicing interdisciplinary care (*Table 4*).

Making the physical environment friendlier

Some acute-care geriatric units have modified their physical and functional environment,[52–55] following the lead of some nursing homes, psychiatric hospitals, and rehabilitation units (*Table 4*).[51] These modifications foster functional independence and allay the disorienting effects of the unfamiliar hospital environment.[52]

provide the orienting clues that permit independent way-finding. The many disturbing, unfamiliar, and often unanticipated routines and procedures may clash with the patient's usual or desired routines. These factors may foster functional dependence, accelerate functional decline, and induce delirium ("ICU psychosis").[1]

In summary, the physical environment and the process of care in the hospital may threaten the independent physical and cognitive function of older patients. Their limited homeostatic reserves, severe illnesses, and multiple comorbid conditions predispose these patients to functional decline, prolonged hospitalization, and greater risk of nursing-home placement. By recognizing the deleterious effects of hospitalization, physicians, nurses, and hospital administrators can modify their practices and attenuate the adverse effects of hospitalization.

OPTIMIZING HOSPITAL CARE

Providing optimal care to older patients requires modifying the hospital environment, preventing ia-

The corridors and patient rooms are carpeted, and clocks and calendars are prominently placed in each room. Patterned carpets and wall coverings with visual contrasts help the patients orient themselves and find their way around. In addition, the rooms have space for personal items from home, the beds have floor lighting, there is additional lighting behind each bed, and the paint and wallpaper colors are visually appealing. Patient rooms are designed to permit privacy, and a large common space (activity room) encourages communal dining, socializing, and light exercise.[52] Many environmental modifications (eg, clocks in rooms and handrails or grab bars) are inexpensive and are suitable for all hospitalized patients.

Preventing iatrogenic illness

We can reduce the incidence of iatrogenic illness by prescribing drugs rationally, avoiding physical restraints and immobility, and selecting diagnostic procedures properly.

Physicians should know the pharmacology of the drugs they prescribe and how drug disposition and

tissue response change in the presence of old age (Table 2), other drugs (Table 3), alcohol, and tobacco. In general, in older patients, fewer drugs and lower doses should be used, and adverse drug effects should be considered as the cause of new symptoms.[56] Physicians can consult a pharmacist or a special computer program when prescribing new or unfamiliar medications.

Alternatives should be considered before psychotropic medications are prescribed. An attempt can be made to calm anxious or mildly confused patients by changing the environment (lowering the lights, quieting the room, turning on background music), using behavioral approaches (speaking in a soft voice, holding the patient's hand, using reality orientation), or recruiting family members and sitters to the patient's bedside. Physicians should resort to psychoactive medications only when the patient's health or comfort is immediately threatened.

When anxiolytic therapy is warranted, benzodiazepines with short to intermediate elimination half-lives are preferable to those with long elimination half-lives.[57] For example, lorazepam in low doses (0.5 to 1.0 mg) is an effective anxiolytic with few drug interactions, and its metabolism is not significantly affected by aging. The hypnotic agent temazepam, at doses of 7.5 to 15 mg, is similar to lorazepam and is preferable to flurazepam, which has a long and highly variable elimination half-life and is associated with ataxia, cognitive impairment, and falls.[31]

Tricyclic antidepressants and antipsychotic drugs should not be employed as anxiolytic-hypnotic agents, even at low doses, because they frequently cause adverse effects. Many of these agents and the antihistamines (eg, diphenhydramine) have prominent anticholinergic properties and may interact to cause delirium, constipation, tachyarrhythmias, or urinary retention.[32]

Antipsychotic agents (eg, haloperidol) are commonly used to calm agitated delirious patients, especially in critical-care units,[58] but their therapeutic index has not been established in controlled trials. Low doses of haloperidol (0.5 to 3.0 mg/24 hours) are often effective and do not create a great risk for dystonic reactions. Haloperidol has an onset of action of 10 to 20 minutes after parenteral administration; it has less anticholinergic action than other antipsychotic drugs and is less likely to cause hypotension.[58] Often, a combination of low doses of haloperidol and lorazepam reduces the agitation, de-

lusions, or hallucinations of delirium more effectively than high doses of the individual drugs given alone.[58]

Alternatives to restraints, developed in nursing homes, can be adapted for use in hospitals.[41] One hospital successfully implemented a policy similar to ones used in nursing homes to reduce the use of mechanical and chemical restraints, and there was no increase in the incidence of serious injuries from falls.[59] Some practical measures that reduce the need to restrain patients include relieving pain, changing treatment (eg, removing catheters), increasing sensory inputs (providing hearing and visual aids), providing reality orientation, bringing in a family companion or a sitter, and providing music therapy.[41]

Psychotropic agents and physical restraints should be avoided unless alternatives are ineffective and the patient's safety requires immediate intervention (eg, to prevent accidental removal of a central line).[60] When restraints are considered necessary, the reasons should be documented in the patient's chart and discussed with the patient, nurse, and family, when applicable, at the first opportunity. Restraints should be used for the shortest time necessary, and their indications should be re-evaluated each nursing shift. Every 2 hours, restraints should be removed to check the skin and to reposition the patient in order to prevent pressure sores. If a patient becomes more agitated after restraints are applied, one should consider removing them and trying alternative strategies.

The risk from diagnostic procedures can be reduced by: (1) drawing only small amounts of blood to prevent anemia; (2) reviewing the fluid and nutritional status of each patient before giving cathartics or enemas; (3) giving oral medications by alternative routes or at different intervals when patients are away from the medical unit; and (4) checking the patient's nutritional status and vital signs after the procedure.

One should also consider whether all planned diagnostic studies are truly necessary, and whether they need to be performed in the hospital. For example, evaluation of gastrointestinal bleeding can be limited to either an upper or lower endoscopic examination when symptoms suggest the source of bleeding.[61]

Detecting and managing functional impairments

Dependence in one or more activities of daily living is likely to be present at admission or to develop during an older patient's hospital stay.[12-15] A

comprehensive functional assessment can identify physical and cognitive impairments and improve the clinical outcomes of hospitalization, eg, prolonged survival, lower costs, reduced use of acute-care hospitals and nursing homes, and improved mood and cognition.[62,63] In one trial comparing usual care with that given in a geriatric evaluation unit, patients assigned to the geriatric unit were less likely to be discharged to a nursing home and less likely to spend any time in a nursing home after discharge; hospital readmissions and mortality over the subsequent 1 year were more common in the group assigned to the regular unit.[64] In another, similar trial, patients assigned to a geriatric assessment and rehabilitation unit were discharged less often to nursing homes and had significantly more functional improvement in several basic self-care activities than patients assigned to usual care, and more were living at home 6 months after admission to the study.[65]

Comprehensive functional assessment is performed by an interdisciplinary team, usually beginning with the primary nurse (*Table 5*). If available, skilled geriatric clinical nurse specialists or geriatric resource nurses can help.[52,66] The patient's primary nurse performs an initial functional assessment and initiates interventions according to guidelines, with the consultation or assistance of the nurse specialist or resource nurse. For example, the nurse dispenses bedside commodes or urinals to patients who have difficulty using the toilet independently. To prevent dependence in walking or getting up, nurses encour-

TABLE 5
INTERDISCIPLINARY GERIATRIC ASSESSMENT: TEAM MEMBERS AND ROLES

Primary nurse and nurse specialist	Assess functional status (basic and instrumental activities of daily living, risk of falling, cognition, mood, special senses, nutrition, skin condition) Implement guidelines to prevent functional decline; conduct daily interdisciplinary rounds Teach patient self-care
Social worker	Assesses patient's social support network, health insurance coverage, care-giving needs Reviews advance directives (living will, durable power of attorney for health care) Evaluates family dynamics (potential care-giver stress or elder abuse) Arranges referrals to community agencies (eg, home care) Arranges transfer to nursing home or rehabilitation hospital
Physical therapist	Evaluates gait and mobility Maintains or improves strength, flexibility, and endurance of muscles and range of motion of joints Recommends assistive devices for ambulation Administers treatment
Occupational therapist	Evaluates and improves ability to perform activities of daily living Fits splints for upper extremities Performs environmental assessment (home visit) and makes recommendations Teaches use of assistive and safety devices
Dietitian	Assesses nutritional status Recommends nutritional interventions (eg, special diets and food supplements) Monitors enteral and parenteral alimentation
Speech pathologist	Evaluates patients with aphasia or dysphagia Recommends swallowing techniques to prevent aspiration
Home care coordinator	Participates in comprehensive discharge planning Assures smooth transition of care from the hospital to home Coordinates care after discharge with patient's physician and other providers

age patients to ambulate or stand at least three times daily and to walk to the activity room for group exercises and meals. Nurses or physical therapists also teach them exercises: active or passive range-of-motion, weight-bearing, resistive, and aerobic.

Nurses and physicians promote mobility by not using physical and chemical restraints and by dispensing walkers, quad canes, grab bars, and bedside appliances such as trapeze bars, wheelchairs, and Hoyer lifts. Patients who need help getting up and walking are referred to a physical or occupational therapist for further evaluation and treatment. Patients exercise in the activity room or in the physical therapy department. The nurse's and therapist's interventions are coordinated with the plans of physicians and other health professionals.

A detailed functional assessment is time-consuming, but standardized screening tests can simplify the process and detect mild degrees of functional impairment.[67] Validated bedside tests for delirium,[67–69] cognitive impairment,[67,70] and depression[67,71] are available and have good sensitivity and specificity. These tests can be administered by nonphysicians.

Nurses can improve detection of functional impairments by performing repeated assessments throughout the day. For example, they have an excellent opportunity to observe the fluctuation in level of attention that characterizes delirium.[69] Likewise, they are likely to first observe changes in a patient's level of independence in performing basic activities of daily living.

Detecting delirium early is important to prevent functional decline. This can be achieved by first reviewing a patient's risk factors for delirium and then performing brief bedside tests of attention and cognition (serial sevens, days of the week backwards, digit span, sentence writing), interviewing family members and care-givers to ascertain a previous history of cognitive impairment, talking to nurses or reading their notes to determine if the patient is disoriented or inappropriate in communication or behaviors or has delusions or hallucinations, and using simplified diagnostic criteria such as the confusion assessment method.[69] The diagnosis of delirium can be made with good accuracy if the following clinical features are observed: acute onset and a fluctuating course; and disorganized thinking or altered level of consciousness, or both.[68]

Once delirium is detected, the cause is sought; infections, systemic diseases, adverse drug effects, and neurologic events are among the most common.[69] The laboratory evaluation is guided by the clinical presenting features. At a minimum, a complete blood count and chemistry panel should be performed.[69]

Delirium of unknown cause warrants additional testing or consultation, because treating the underlying cause is of foremost importance. Often this means discontinuing medications or reducing the doses. In other situations, it may mean giving supplemental oxygen, pressor agents, or volume expanders (as in postoperative delirium). In still other situations, it may mean treating an underlying infection such as pneumonia, a urinary tract infection, or a wound infection. Nurses can help prevent or reverse the symptoms of delirium through interventions such as assuring continuity of care, correcting sensory deficits, providing orientation stimuli (reality orientation), and encouraging social visits from family members.[69]

Promoting mobility and physical activity

Patients should begin physical therapy and bedside exercises on the first hospital day to maintain joint flexibility and muscle strength and to avoid pressure sores. Physical activity should not be limited unless there are explicit contraindications to it.[1] Patients with impaired ability to transfer or walk independently will benefit from devices such as canes and walkers. Handrails in the hallways and grab bars in bathrooms promote safety and encourage independent mobility. Nurses or therapists can teach patients to perform bedside range-of-motion exercises and low-impact resistive exercises.[52] We can further enhance mobility by not using physical and chemical restraints, as discussed previously. As patients convalesce from acute illnesses, they can spend more time in the activity room, where they can exercise and socialize with other patients.

Assessing and treating malnutrition

The Nutrition Screening Initiative is promoting awareness of the importance of nutritional screening and intervention[72]: the medical history, physical examination, and laboratory evaluation all provide critical information in the assessment of malnutrition. A history of weight loss is an important and sensitive antecedent of malnutrition and is predictive of death after discharge from the hospital.[45]

The diagnosis of protein-calorie malnutrition is often based on physical features such as loss of lean body mass, temporal muscle wasting, generalized weakness, and glossitis, and on measurements of serum albumin, cholesterol, hemoglobin, and other biochemical markers.[72,73] However, these physical and biochemical features may be insensitive in early or mild malnutrition.[72]

Malnutrition is suspected at admission in patients with recent unintentional weight loss, generalized weakness, muscle atrophy, a serum albumin concentration less than 3.0 g/dL, a serum cholesterol concentration less than 150 mg/dL, or unexplained normocytic anemia.[72,73] Diagnostic evaluation of these patients may reveal evidence of underlying chronic diseases, dysphagia, dementia, or depression.[46]

Therapy often includes high-calorie and high-protein diets (including nutritional supplements or snacks) and, less commonly, enteral or parenteral

alimentation.[74,75] Social visits and meals with family members can help restore the patient's appetite. Fluid and caloric requirements should be prescribed and monitored daily to prevent undernutrition. Nutritional supplements can improve the clinical outcome of hospitalization. In one study, elderly patients with femoral neck fractures had fewer in-hospital complications and a shorter length of hospital stay if they were given oral nutritional supplements.[76]

Meeting psychosocial needs, respecting personal values

Hospitalized patients often experience anxiety, fear, and distress, which may be exacerbated when they or their families harbor negative expectations of hospital outcome. Depression may interfere with recovery of physical function.[20] Family members may wonder how they will care for a physically and functionally impaired older person at home.

Physicians and nurses should address these needs. Meeting with the patient and family may allay the patient's fears and clarify confusing aspects of the patient's personal needs in the hospital and afterward. Pain can be relieved with adequate doses of analgesics and other comfort measures; fear can be alleviated through continuity of nursing care, correction of sensory deficits, reality orientation, social visits from family members, and a quiet environment that promotes relaxation and sleep at night.[77]

The patient's personal values and perceptions of the hospital experience should be explored. Advance directives and the patient's wishes for treatment should be discussed early in the hospital stay. These discussions with patients will affect their care in the hospital. In one study, the patients' self-reported wishes and the physicians' judgment of medical utility were the most important factors that physicians took into account when making recommendations about resuscitation.[78] Another study found that costs were lower when patients were admitted with an established do-not-resuscitate order than when the order was made during the hospital stay.[79] Thus, early efforts to determine the patient's expectations of hospitalization, attitudes regarding cardiopulmonary resuscitation, and advance directives may improve clinical outcomes.

Providing interdisciplinary care

An interdisciplinary team provides the necessary expertise to assess and treat older patients in the hospital. Physicians work with a wide range of health professionals (Table 5). However, as not every patient needs the services of every team member, the physician should initiate the interdisciplinary process with the patient's nurse. After the physician and nurse evaluate a patient, other team members can be recruited as needed.

Discharge planning, a major focus of the interdisciplinary team, ideally begins early in the hospital stay.[80] Despite its importance, it has been a neglected aspect of patient care.[81] Recently, however, some institutions have designed models for interdisciplinary discharge planning that identify high-risk patients, evaluate and optimize their functional status, develop a comprehensive plan that is reassessed throughout hospitalization, and ensure continuity of care during the transition from hospital to home.[82] One hospital unit that emphasized discharge planning was able to significantly reduce the mean length of stay and total charges.[54] In another study, discharge planning coordinated by a gerontologic nurse specialist helped to reduce the incidence of rehospitalization 12 weeks after discharge.[83]

Decisions about when to discharge patients and where to send them present great challenges to physicians and team members. Patients not terminally ill should not be discharged from the hospital if they have evidence of clinical instability on the day of planned discharge: a new finding of incontinence, chest pain, dyspnea, delirium, tachycardia, or hypotension; a temperature higher than 38.3°C; or a diastolic blood pressure of 105 mm Hg or greater.[84] Elderly patients sent home in an unstable condition are twice as likely to die within 30 days than those whose condition is stable.[84]

Patients who need assistance in their activities of daily living or who have inadequate social support in the community are more likely to enter a nursing home than are functionally independent patients.[85] However, some carefully selected elderly patients will improve their independent functioning at home with structured interventions after a short stay in the hospital.[86]

Patients who receive early, systematic discharge planning are more likely to successfully return home and are less likely to have an unscheduled readmission.[80] Home health care is used more often by patients with low educational levels, inaccessible social supports, and impairments in one or more instrumental activities of daily living.[87] An interdisciplinary evaluation will facilitate the transition from hospital to home.

SUMMARY

Efforts to modify the physical environment, prevent iatrogenic illness, detect and treat functional impairments, promote mobility, assess and treat malnutrition, recognize psychosocial needs and personal values, and practice interdisciplinary care can attenuate the adverse effects of hospitalization. The personal, physical, and functional needs of older patients need not be ignored, even in modern, fast-paced, technology-oriented, acute-care hospitals. We can, through comprehensive assessment and interdisciplinary collaboration, address those needs and improve patient outcomes.[88,89]

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